

NAKAYAMA
Serial No. 10687,620

Atty Dkt: 914-170
Art Unit: 2814

REMARKS/ARGUMENTS

Reexamination of the captioned application is respectfully requested.

A. SUMMARY OF THIS AMENDMENT

By the current amendment, Applicants basically:

1. Cancel claim 6 without prejudice or disclaimer.
2. Amend claims 1, 2, and 3 to include therein limitations of dependent (now cancelled) claim 6.
3. Respectfully traverse all prior art rejections.

B. SELECTED COMMENTS REGARDING THE DISCLOSURE

In one of its aspects, the disclosure pertains to a method of making a semiconductor device wherein a polycrystalline microstructure is formed. In particular, the polycrystalline microstructure is formed by lateral solidification from a boundary of a region of a semiconductor material layer, the formation involving irradiation using a laser. The method includes promoting uniform cooling of the semiconductor material after irradiation. Such uniform cooling results, e.g., not only increased grain size, but also increased grain width.

B. PATENTABILITY OF THE CLAIMS

Claims 1-20 stand rejected under 35 USC 103(a) as being unpatentable over U.S. Publication 2003/0059991 to Teramoto et al in combination with U.S. Publication 2004/0201874 to Yamazaki, U.S. Publication 2005/0148119 to Fujimura, U.S. Patent 4,584,025 to Takaoka et al and U.S. Publication 2003/0148565 to Yamanaka. All prior art rejections are respectfully traversed for at least the following reasons.

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All three independent claims 1, 2, and 3 have been amended to require specifically that laser be an extended laser or a continuous wave laser. Such amendatory language, taken directly from dependent claim 6, constitutes neither new matter nor a new issue.

U.S. Publication 2003/0059991 to Teramoto et al teaches KrF or XeCl laser light. However, in U.S. Publication 2003/0059991 to Teramoto et al laser 331 does not have a mechanism to extend the pulse duration, as plainly seen in Fig. 20. Further Teramoto makes no reference to pulse duration extension (see, for example, ¶00275). Further, Teramoto's laser light is shaped linearly and adjusted so that the cross section has a predetermined width and a predetermined length (see, e.g., ¶0258). For example, Teramoto teaches that the cross section of the laser light is shaped in a form extending in the thickness direction of Fig. 10(B). Nor is a mechanism to extend the pulse duration of Teramoto's excimer laser taught or suggested in Fig. 5 (or, for example, ¶0242). Therefore, the semiconductor device manufacturing method disclosed by U.S. Publication 2003/0059991 to Teramoto et al is basically a variation of the excimer laser crystallization (ELC) method taught in the Background portion of Applicant's specification (see, e.g., page 1, line 23 – page 2, line 24), supplemented with a heating process.

By contrast, Applicant's pending amended independent claims involve a sequential lateral solidification (SLS) technique, in which a pulse laser is typically used, as well as a continuous wave laser, thereby differing for this and other reasons from the ELC method. Applicant's claimed methods provide a significant advantage of the crystal growing towards the center of the irradiated region from the boundary/interface of a laser irradiated region and a non-irradiated region, to obtain a crystal structure having a large grain size with at least 2 μm in length and at least 0.5 μm in width (as explained, e.g., by page 2, line 25 – page 3, line 17; page 4, lines 31 – 33; page 5, lines 15 – 17; page 12, lines 7 – 19; page 13, line 21 – page 14, line 11).

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None of the other references applied in the office action appear to remedy the deficiencies of U.S. Publication 2003/0059991 to Teramoto et al, nor does the office action allege such remediation. No applied reference or combination of applied references provide a basis for denying patentability of the pending claims.

C. MISCELLANEOUS

In view of the foregoing and other considerations, all claims are deemed in condition for allowance. A formal indication of allowability is earnestly solicited.

The Commissioner is authorized to charge the undersigned's deposit account #14-1140 in whatever amount is necessary for entry of these papers and the continued pendency of the captioned application.

Should the Examiner feel that an interview with the undersigned would facilitate allowance of this application, the Examiner is encouraged to contact the undersigned.

Respectfully submitted,

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